



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/763,985	02/28/2001	Kyogo Itoh	0020-4817P	3467

2292 7590 08/20/2003

BIRCH STEWART KOLASCH & BIRCH
PO BOX 747
FALLS CHURCH, VA 22040-0747

EXAMINER

HELMS, LARRY RONALD

ART UNIT	PAPER NUMBER
----------	--------------

1642

DATE MAILED: 08/20/2003

15

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/763,985

Applicant(s)

ITO ET AL.

Examiner

Larry R. Helms

Art Unit

1642

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 June 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 3-34 is/are pending in the application.
- 4a) Of the above claim(s) 6,9-18,20 and 22-31 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 3-5,7,8,19 and 21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: |

DETAILED ACTION

1. Claims 19, 32-33 have been amended.
2. Claims 6, 9-18, 20, 22-31 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected inventions. Election was made **without** traverse in Paper No. 11.
3. Claims 3-5, 7-8, 19, 21, 32-34 are under examination.
4. The text of those sections of Title 35 U.S.C. code not included in this office action can be found in a prior Office Action.
5. The following Office Action contains some NEW GROUNDS of rejection.

Rejections Withdrawn

6. The rejection of claims 3-5, 7-8, 19, 21, 23-34 under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention is withdrawn in view of the amendments to the claims.
7. The rejection of claims 3-5, 7-8, 19, 21, 32-34 under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the

Art Unit: 1642

inventor(s), at the time the application was filed, had possession of the claimed invention is withdrawn in view of the amendments to the claims.

8. The rejection of claims 3-5, 7-8, 19, 21, 32-34 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention is withdrawn in view of amendments to the claims and the new ground of rejection under 112 first paragraph.

9. The rejection of claims 7-8, 19, 21, 23, and 33 are rejected under 35 U.S.C. 102(b) as being anticipated by Nagase et al (DNA Res. 2:167-174, 1995) is withdrawn in view of the new grounds of rejection.

10. The rejection of claims 3-5, 7-8, 19, 21, and 32-34 under 35 U.S.C. 103(a) as being unpatentable over Nagase et al (DNA Res. 2:167-174, 1995) as applied to claims 7-8, 19, 21, 32-33 above, and further in view of Campbell (Monoclonal antibody technology, Elsevier Science Publishers, Chapter 1, pages 1-32) and Sambrook et al (Molecular Cloning, A Laboratory Manual, Chapters 3 and 12, 1989) is withdrawn in view of the new grounds of rejection.

The following are NEW GROUNDS of rejections

Claim Rejections - 35 USC § 112

11. Claims 3-5, 7-8, 19, 21, 32-34 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Factors to be considered in determining whether undue experimentation is required, are summarized in Ex parte Forman, 230 USPQ 546 (BPAI 1986). They include the nature of the invention, the state of the prior art, the relative skill of those in the art, the amount of direction or guidance disclosed in the specification, the presence or absence of working examples, the predictability or unpredictability of the art, the breadth of the claims, and the quantity of experimentation which would be required in order to practice the invention as claimed.

The claims are broadly drawn to pharmaceutical compositions and compositions for treating and preventing cancer with the polynucleotides claimed.

The specification teaches the identification of a tumor antigen peptide, referred to as SART-3 (SQ ID NO:2). The specification further contemplates the use of the DNA molecule encoding the tumor antigen for the immunotherapy of cancer diseases (page 15-18) where "in theory, any method of gene therapy may be used for immunotherapy of cancer based on DNA" (page 16) both *in-vivo* or *in-vitro*. The specification does not enable treatment or prevention of any cancer with the polynucleotides of the invention.

One cannot extrapolate the teachings of the specification to the scope of the claims because the specification provides no exemplification of or guidance on how to

Art Unit: 1642

use the claimed pharmaceutical (i.e. DNA vaccine) for immunization purposes with any predictability and to treat or prevent any cancer in a subject. With regards to tumor immunotherapy, the goal of tumor vaccination is the induction of tumor immunity to prevent tumor recurrence and to eliminate residual disease. However, gene therapy against tumors is highly unpredictable as underscored by Crystal, R.G. (Science, Vol. 270, October 1995, pages 404-410) who teaches that in tumor vaccine studies intended to evoke a tumor-directed immune response, there is no convincing evidence (other than anecdotal case reports) that tumors actually regress, despite the promising observations in experimental animals. In other words, humans are not simply large mice (page 409, 1st column). More recently, Tait *et al.* (Clin.Canc.Res., Vol. 5, July 1999, pages 1708-1714) revealed just how unpredictable gene therapy was in the clinical setting. The authors' prior phase I trial of 12 patients with extensive ovarian cancer treated with a retroviral vector expressing the BRCA1 splice variant (LXSN-BRCA1sv) demonstrated vector stability, minimal immune response, gene transfer and expression, and some tumor reduction in the patients (page 1708, 2nd column, 2nd paragraph). In contrast, the Phase II trial initiated in patients with stage III and IV grade ovarian cancer, showed a high preponderance for vector instability (vector was degraded rapidly), a rapid immunological response invoking neutralizing antibodies to the retroviral vector, and no clinical response to the therapy. Although the difference in response to the therapy may be attributed to differences in immunocompetence between the phase I and II patients (page 1712, 2nd column), the end result seems to indicate that further experimentation is necessary prior to the successful application of

Art Unit: 1642

DNA vaccines, especially with the regards to cancer therapy. There is no suggestion in the specification that the expression of these antigens from the polynucleotide has resulted in autoantibodies against the antigen thus it would be highly unpredictable that administration of the polynucleotide that encodes the antigen as a cancer vaccine, into patients would lead to an effective immune response against the tumor. Further, treatment of cancer in general is at most unpredictable, as underscored by Gura (Science, v278, 1997, pp.1041-1042) who discusses the potential shortcomings of potential anti-cancer agents including extrapolating from in-vitro to in-vivo protocols, the problems of drug testing in knockout mice, and problems associated with clonogenic assays. Indeed, since formal screening began in 1955, thousands of drugs have shown activity in either cell or animal models, but only 39 that are used exclusively for chemotherapy, as opposed to supportive care, have won approval from the FDA (page 1041, 1st column) wherein the fundamental problem in drug discovery for cancer is that the model systems are not predictive. All of this underscores the criticality of providing workable examples which is not disclosed in the specification, particularly in an unpredictable art, such as cancer therapy.

In view of the teachings above, and the lack of guidance and or exemplification in the specification, it would not be predictable for of skill in the art to use the pharmaceutical compositions or vaccine formulations as contemplated in the disclosure. Thus, it would require undue experimentation by one of skill in the art to practice the invention as claimed.

The response filed 6/6/03 has been carefully considered but is deemed not to be persuasive. The response states that the article of Miyagi et al (Clinical Cancer Res. 7:3950-3962, 2001, attachment to #14) describes the results of peptides derived from SART-3 were administered to cancer patients (see page 10-11 of response). In response to this argument, the reference is not on subject because the claims are directed to a polynucleotide administered to the cancer patient and the art does not address this application.

Claim Rejections - 35 USC § 102

12. Claims 7-8, 19, 21, 23, and 33 are rejected under 35 U.S.C. 102(b) as being anticipated by Nagase et al (DNA Res. 2:167-174, 1995) as evidenced by Kurshid et al (Analytical Biochemistry 208:138, 1993, abstract).

The claims recite a polynucleotide of SEQ ID NO:1 or a nucleotide of 12 to 2900 of SEQ ID NO:1 wherein the polynucleotide encodes a tumor antigen wherein the tumor antigen protein gives rise to peptide fragments and bind to HLA antigen and are recognized by cytotoxic T lymphocytes and compositions comprising such. For this rejection the intended use of a pharmaceutical composition and pharmaceutical composition for treatments or prevention of tumor is given no patentable weight.

Nagase et al teach a molecule that encodes the identical protein of SEQ ID NO:2. The molecule is identical to the coding region of SEQ ID NO:1 except for one nucleotide (see the attached sequence alignment on the back of this office action). As

Art Unit: 1642

is readily known in the art sequencing errors do exist in polynucleotide sequences as evidenced from Kurshid et al the error rate in nucleotide sequences in ESTs is 2.45 percent. This rate is within the error of one or two nucleotide bases in 3798 bases that are in SEQ ID NO:1. Thus because of errors in the sequencing of polynucleotides it would be concluded that the molecule of Nagase et al is the same as the molecule of the instant applications polynucleotide. In addition, it would be inherent that the protein of Nagase et al would give peptides that would bind to HLA antigen and be recognized by cytotoxic T lymphocytes.

Claim Rejections - 35 USC § 103

13. Claims 3-5, 7-8, 19, 21, and 32-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nagase et al (DNA Res. 2:167-174, 1995) as applied to claims 7-8, 19, 21, 32-33 above, and further in view of Campbell (Monoclonal antibody technology, Elsevier Science Publishers, Chapter 1, pages 1-32) and Sambrook et al (Molecular Cloning, A Laboratory Manual, Chapters 3 and 12, 1989).

Claims 7-8, 19, 21, 32-33 have been described supra. Claims 3-5, and 34 recite an expression plasmid with the polynucleotide and a transformant transformed with the expression plasmid and a method of producing the protein. For this rejection the intended use of a pharmaceutical composition and pharmaceutical composition for treatments or prevention of tumor is given no patentable weight.

Art Unit: 1642

Nagase et al has been described supra. Nagase et al does not teach an expression plasmid or a transformant with the expression plasmid. This deficiency is made up for in the teachings of Campbell and Sambrook et al.

Campbell teach that it is customary now for any group working on a macromolecule to both clone the genes coding for it and make monoclonal antibodies to it for basic research (see page 29).

Sambrook et al teach expression plasmids and host cells for expression of proteins.

It would have been prima facie obvious to one of ordinary skill in the art at the time the claimed invention was made to have placed the DNA of Nagase et al in an expression plasmid to produce the protein.

One of ordinary skill in the art would have been motivated to and had a reasonable expectation of success to have placed the DNA of Nagase et al in an expression plasmid to produce the protein because Campbell teach it is customary now for any group working on a macromolecule to both clone the genes coding for it and make monoclonal antibodies to it for basic research (see page 29). In addition, one of ordinary skill in the art would have been motivated to and had a reasonable expectation of success to have placed the DNA of Nagase et al in an expression plasmid to produce the protein because Sambrook et al teach expression vectors and methods of expression of the DNA for structural and biochemical analysis (see page 16.2). Thus, It would have been prima facie obvious to one of ordinary skill in the art at the time the claimed invention was made to have placed the DNA of Nagase et al in an expression

Art Unit: 1642

plasmid to produce the protein because it is routinely done in basic research to further characterize the protein.

Therefore, the invention as a whole was prima facie obvious to one of ordinary skill in the art at the time the invention was made, as evidenced by the references.

The response filed 6/6/03 has been carefully considered but is deemed not to be persuasive. The response states that at the time of the present invention SART-3 was not known in the art to be a tumor antigen protein and there would not be any motivation to use SART-3 for treatment of cancer. As stated in the rejection the intended use of the polynucleotides for treatment or prevention is given no patentable weight for this rejection. Thus, the prior art only need teach the polynucleotide and motivation to place the DNA in a vector for expression which it does as stated above.

Conclusion

14. No claim is allowed.

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Larry R. Helms, Ph.D, whose telephone number is (703) 306-5879. The examiner can normally be reached on Monday through Friday from 7:00 am to 4:30 pm, with alternate Fridays off. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Anthony Caputa, can be

Art Unit: 1642


reached on (703) 308-3995. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0196.

16. Papers related to this application may be submitted to Group 1600 by facsimile transmission. Papers should be faxed to Group 1600 via the PTO Fax Center located in Crystal Mall 1. The faxing of such papers must conform with the notice published in the Official Gazette, 1096 OG 30 (November 15, 1989). The CM1 Fax Center telephone number is (703) 308-4242.

Respectfully,

Larry R. Helms Ph.D.

703-306-5879



LARRY R. HELMS, PH.D
PRIMARY EXAMINER

QY 3665 TCTCTTCAAACTTCTGCTGAATGCTACTAGATGCTGATTCACATACAGATGCTTTT 3724
 Db |||||
 QY 3673 TCTCTTCAAACTTCTGCTGAATGCTACTAGATGCTGATTCACATACAGATGCTTTT 3732
 Db |||||
 QY 3725 GAAGTGGGTGCTACCTTCTTACCTTAATAGATGCTGTAATAGAACCTTTTGTAACTC 3780
 Db |||||
 QY 3733 GAAGTGGGTGCTACCTTCTTACCTTAATAGATGCTGTAATAGAACCTTTTGTAACTC 3788
 Db |||||

RESULT 2

D63879 3660 bp mRNA linear PRI 06-OCT-2001
 LOCUS Human mRNA for KIAA0156 gene, complete cds.
 DEFINITION D63879
 ACCESSION D63879
 VERSION D63879.1 GI:961449
 KEYWORDS KIAA0156.
 SOURCE Homo sapiens male myeloblast cell_line:KG-1 cdna to mRNA.
 ORGANISM Homo sapiens
 Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
 Mammalia; Eutheria; Primates; Catarrhini; Hominidae; Homo.

REFERENCE

1 Nagase, T., Seki, N., Tanaka, A., Ishikawa, K. and Nomura, N.
 Prediction of the coding sequences of unidentified human genes. IV.
 The coding sequences of 40 new genes (KIAA0121-KIAA0160) deduced by
 analysis of cDNA clones from human cell line KG-1
 DNA Res. 2 (4), 167-174 (1995)
 96127530

REFERENCE

2 (bases 1 to 3660)
 Ohara, O., Nagase, T., Kikuno, R. and Nomura, N.
 Direct Submission
 Submitted (11-AUG-1995) Osamu Ohara, Kazusa DNA Research Institute;
 1532-3, Yana, Kisarazu, Chiba 292-0812, Japan
 (E-mail:cdna@kazusa.or.jp, Tel: +81-438-52-3913)
 Location/Qualifiers

FEATURES

source

1. 3660
 /organism="Homo sapiens"
 /db_xref="taxon:9606"
 /sex="male"
 /cell_line="KG-1"
 /cell_type="myeloblast"
 1. 3660
 /gene="KIAA0156"
 1. 2892
 /gene="KIAA0156"
 /note="KIAA0156 gene product is related to Xenopus
 nucleolin."
 /codon_start=1
 /protein_id="BAA09929.1"
 /db_xref="GI:961450"
 /translation="MATAETSASEPEASKAGPKADGEDEVKAARTKKVLSRAVA
 AATKMGPAWQDEGVSDGDEYAMASSSPGEYEWEDDEEKNQLEIERLE
 EQLSINYDYNCHVDLIRLLREGLTKVMARQKSEIFPLTEELWLEHDEISMA
 QGDLDRHVLDPEKAVKDYICPNWLEYGVSGVGGKGLKRVSVFERALSSVG
 LMTKGLALWEAREFESAIVEARLEKHSPLRROLAIPLYDMEATFAEYEWSDP
 IPESVIONKALQLEKYPYEEALLQAPRLAEPYQAYIDFEMKIGDPARQLIFE
 RALVENCIVFLMIRISQYLDRLKVDLVSHNRNRCNPWTVALWSKYLAMERH
 GVDFHVSITFEKALNAGFIQATYDIWEQYLDYLRVRVDFKQDSKLEELRAFT
 RALEYKQVEYERNSGDPSCVIMQNWAEIARLNNMOKRELWDSINTGRNARYA
 NMWLEYNLEAHHGDTQHCALHRAVQCTSDYPEHVEVLLTMEETGSLDWDIAV
 OKTEFLARVNEQRMKAKEAALVOEEKEAQRKRAEKALKKKKIRGPKRG
 ADEDEKWDGDEEOPSKRRRVENSIPAGETQNVVEAGPAGKCANVDVPPSKQK
 EKAASLRDKPKVLHSDKSDIIVFVNSLPYEMQEDTKLRPLFEACGEVQVQIRPLFS
 NRGDFRGYCVFEKEKSAQALEMDRKSVEGPMFVSPCVDSKPNDFKVFYRYSLSL
 EKHFLFTSGLPFCSTKEELEECIKHGTVKRDLRLVTRNAGPKPLGLAYVEYENESQASQ
 AVMKDGMTIKENIKVAISNPQRKVPKPEPKAPGPMPLPQTYGARGKRTQLS
 LLPALQPSAAAPQAPNGPAAAPAAVAPAAPEAPKMSNDAFKLFLK"
 986 a 824 c 1049 g 801 t

gene

CDS

12 ATGGCGACTGGCGCGAAGAACCTCGCTTCAGAACCCGAGGCTGAGTCCAGGCTGGGCC 71
 1 ATGGCGACTGGCGCGAAGAACCTCGCTTCAGAACCCGAGGCTGAGTCCAGGCTGGGCC 60
 72 AAGGCTGACGGAGAGAGGAGGATGAGGTTAAGGCGGCTAGGCAAGAGGAGAGGTTATCG 131
 61 AAGGCTGACGGAGAGAGGAGGATGAGGTTAAGGCGGCTAGGCAAGAGGAGGTTATCG 120
 132 CGGGCTGTGGCGCTGCGACATACAAAGCATTAGGGGCGAGCGTGGGATACAGAGAGGA 191
 121 CGGGCTGTGGCGCTGCGACATACAAAGCATTAGGGGCGAGCGTGGGATACAGAGAGGA 180
 192 GCGCTGACGGAGAGGAGGATGAGGTTAAGGCGGCTAGGCAAGAGGAGGTTATCG 25
 181 GCGCTGACGGAGAGGAGGATGAGGTTAAGGCGGCTAGGCAAGAGGAGGTTATCG 24
 252 GGGGAGTACGAGTGGGAATATGACGAAGAGGAGGAGGAGGAGGAGGAGGAGGAGGAG 171
 241 GGGGAGTACGAGTGGGAATATGACGAAGAGGAGGAGGAGGAGGAGGAGGAGGAGGAG 160
 312 CTGGAGGAGGAGGAGGAGGAGGAGGAGGAGGAGGAGGAGGAGGAGGAGGAGGAGGAG 171
 301 CTGGAGGAGGAGGAGGAGGAGGAGGAGGAGGAGGAGGAGGAGGAGGAGGAGGAGGAG 160
 372 CTGCTCAGGCTGGAAGGGGAGGCTTACCAAGGTGAGGATGCGCGCGCGAGGAGGAG 131
 361 CTGCTCAGGCTGGAAGGGGAGGCTTACCAAGGTGAGGATGCGCGCGCGAGGAGGAG 120
 432 ATCTTTCCCTTACCTGACCTGAAGAGCTCTGGGTGAGTGGCTGCATGACGAGATCAG 171
 421 ATCTTTCCCTTACCTGACCTGAAGAGCTCTGGGTGAGTGGCTGCATGACGAGATCAG 160
 492 CAGGATGGCTGGACAGAGAGGAGGAGGAGGAGGAGGAGGAGGAGGAGGAGGAGGAG 171
 481 CAGGATGGCTGGACAGAGAGGAGGAGGAGGAGGAGGAGGAGGAGGAGGAGGAGGAG 160
 552 ATTTGCTCTTAACTATTTGGCTAGAGTATGCCAGTACTACTAGTTGGTGGGATTCGTC 171
 541 ATTTGCTCTTAACTATTTGGCTAGAGTATGCCAGTACTACTAGTTGGTGGGATTCGTC 160
 612 GGTGGCTTTGAGAAAGTTCCGCTCCGCTGTTTGAAGGGGCTCTCTCGTCTCTGTTTACAT 171
 601 GGTGGCTTTGAGAAAGTTCCGCTCCGCTGTTTGAAGGGGCTCTCTCGTCTCTGTTTACAT 160
 672 ATGACCAAGAGGACTCGCCCTCTGGGAGGCTTACCGAGAGTTTCCAGATTCGATTCGAA 171
 661 ATGACCAAGAGGACTCGCCCTCTGGGAGGCTTACCGAGAGTTTCCAGATTCGATTCGAA 160
 732 GCTGCTCGCTTCAGAAAGTCCACAGCTCTTTCCCGCGAGAGTTGGCGATCCGATCTAT 171
 721 GCTGCTCGCTTCAGAAAGTCCACAGCTCTTTCCCGCGAGAGTTGGCGATCCGATCTAT 160
 792 GATATGGAGGCGACATTTGACAGAGTATGAAGATGCTCAGAGACCCCAATACAGAGTCA 171
 781 GATATGGAGGCGACATTTGACAGAGTATGAAGATGCTCAGAGACCCCAATACAGAGTCA 160
 852 GTAAATTCAGAACTATTAACAAAGCATTACAGAGCTGGAGAAATATAAACCCTATGAG 171
 841 GTAAATTCAGAACTATTAACAAAGCATTACAGAGCTGGAGAAATATAAACCCTATGAG 160
 912 GCACTCTTCAGCAGCAGCAGCAGCAGCAGCAGCAGCAGCAGCAGCAGCAGCAGCAGCAG 171
 901 GCACTCTTCAGCAGCAGCAGCAGCAGCAGCAGCAGCAGCAGCAGCAGCAGCAGCAGCAG 160
 972 ATGAAATTTGGCGATCTCTGCTCCATTCAGTTGATCTTTGAGCGCGCCCTGGTTCGAG 171
 961 ATGAAATTTGGCGATCTCTGCTCCATTCAGTTGATCTTTGAGCGCGCCCTGGTTCGAG 160
 1032 TGCCTTTGCCAGACTTATGGATTCGCTTACAGTACCTAGTACGACAACTGAGAAAGTA 1091
 1021 TGCCTTTGCCAGACTTATGGATTCGCTTACAGTACCTAGTACGACAACTGAGAAAGTA 1080

BASE COUNT

ORIGIN

Query Match 96.3%; Score 3656.8; DB 9; Length 3660;
 Local Similarity 99.9%; Pred. No. 0;
 Conservative 0; Mismatches 2; Indels 0; Gaps 0;

QY 1092 AAGGATTTGGTTTATCTGTACATAACCGGCTATTAGAACTGCCCTGGACAGTTGCC 1151
DB 1081 AAGGATTTGGTTTATCTGTACATAACCGGCTATTAGAACTGCCCTGGACAGTTGCC 1140
QY 1152 TTATGAGTGGTACCTCTTGGCCATGGAGACATGGAGTTGATCATCAAGTAAATTTCT 1211
DB 1141 TTATGAGTGGTACCTCTTGGCCATGGAGACATGGAGTTGATCATCAAGTAAATTTCT 1200
QY 1212 GTAACCTTCGAGAAAGCTTTGAATGCGGCTTCATCCAGGCCACTGATTATGFGAGATT 1271
DB 1201 GTAACCTTCGAGAAAGCTTTGAATGCGGCTTCATCCAGGCCACTGATTATGFGAGATT 1260
QY 1272 TGGCAGGCATACCTTGATTTACCTGAGAGAGAGGGTTGATTTCAAAACAGACTCCAGTAAA 1331
DB 1261 TGGCAGGCATACCTTGATTTACCTGAGAGAGAGGGTTGATTTCAAAACAGACTCCAGTAAA 1320
QY 1332 GAGCTGGAGAGTTGAGGCGGCTTTACTCGCTTGGAGTATCTGAAGCAGGAGGTG 1391
DB 1321 GAGCTGGAGAGTTGAGGCGGCTTTACTCGCTTGGAGTATCTGAAGCAGGAGGTG 1380
QY 1392 GAAGAGGCTTCAATGAGAGTGGTGATCCAAAGCTGCGTGATATGAGAACTGGGCTAGG 1451
DB 1381 GAAGAGGCTTCAATGAGAGTGGTGATCCAAAGCTGCGTGATATGAGAACTGGGCTAGG 1440
QY 1452 ATTGAGGCTCGACTGTGCAATACATGCAAGAGCTCGGAAGCTGGGATACATCATG 1511
DB 1441 ATTGAGGCTCGACTGTGCAATACATGCAAGAGCTCGGAAGCTGGGATACATCATG 1500
QY 1512 ACCAGAGGAATGCCAAGTACGCAACATCTGCTAGAGTATTACAACTGGAAAGAGCT 1571
DB 1501 ACCAGAGGAATGCCAAGTACGCAACATCTGCTAGAGTATTACAACTGGAAAGAGCT 1560
QY 1572 CATGGTGACACCCAGCACTGCCGGAAGGCTCTGCACCGGCGCTCCAGTGACAGTGAC 1631
DB 1561 CATGGTGACACCCAGCACTGCCGGAAGGCTCTGCACCGGCGCTCCAGTGACAGTGAC 1620
QY 1632 TACCCAGAGCACTCTCGGAAGTGTACTCAACATGGAGAGGACAGAGGTTCTTTAGAA 1691
DB 1621 TACCCAGAGCACTCTCGGAAGTGTACTCAACATGGAGAGGACAGAGGTTCTTTAGAA 1680
QY 1692 GATTGGGATATAGTGTTCAGAAACTGAAACCGGATTAGCTGCTCAATGAGCAGAGA 1751
DB 1681 GATTGGGATATAGTGTTCAGAAACTGAAACCGGATTAGCTGCTCAATGAGCAGAGA 1740
QY 1752 ATGAAGGCTCGAGAGAGGAGCAGCCCTTTGTGACGAGAAAGAAAGGCTGAAACAA 1811
DB 1741 ATGAAGGCTCGAGAGAGGAGCAGCCCTTTGTGACGAGAAAGAAAGGCTGAAACAA 1800
QY 1812 CGGAAAAGAGCTCGGCTGAGAAAGAGCCTTAAAGAGAGAAAGATCAGAGGCCCA 1871
DB 1801 CGGAAAAGAGCTCGGCTGAGAAAGAGCCTTAAAGAGAGAAAGATCAGAGGCCCA 1860
QY 1872 GAGAAAGCGGAGCAGATGAGGAGGATGAGAAAGAGTGGGCGGATGATGAAGAGAGCAG 1931
DB 1861 GAGAAAGCGGAGCAGATGAGGAGGATGAGAAAGAGTGGGCGGATGATGAAGAGAGCAG 1920
QY 1932 CTTTCCAAACGCAAGGGTTCGAGAACAGCATCCCTGACGCTGGAGAAACACAAATGTA 1991
DB 1921 CTTTCCAAACGCAAGGGTTCGAGAACAGCATCCCTGACGCTGGAGAAACACAAATGTA 1980
QY 1992 GAAGTACAGAGGCGGCTGGGAAATGTGCTGCCGTAGATGFGAGGCCCTTCGAAG 2051
DB 1981 GAAGTACAGAGGCGGCTGGGAAATGTGCTGCCGTAGATGFGAGGCCCTTCGAAG 2040
QY 2052 CAGAGGAGAGGAGGAGCTCCCTCAAGAGGAGACATGCCAAGGTCGACAGCAGCAGC 2111
DB 2041 CAGAGGAGAGGAGGAGGAGCTCCCTCAAGAGGAGACATGCCAAGGTCGACAGCAGCAGC 2100
QY 2112 AAGGACAGCATCACCGCTTTGTGACGAAACCTGCGCTACAGCATGCGAGGAGCGGACAG 2171
DB 2101 AAGGACAGCATCACCGCTTTGTGACGAAACCTGCGCTACAGCATGCGAGGAGCGGACAG 2160
QY 2172 AAGCTCAGGCGCACTCTTCGAGGCGCTGTGGGAGGTGTCAGATCCGAGCCATCTTCAGC 2231

DB 2161 AAGCTCAGGCGCACTCTTCGAGGCGCTGTGGGAGGTGGTCCAGATCCGACCATCTTCAGC 2220
QY 2232 AACCGTGGGATTTCCGAGGTTACTGCTACGTGGAGTTTAAAGAGAGAAATCAGCCCTT 2291
DB 2221 AACCGTGGGATTTCCGAGGTTACTGCTACGTGGAGTTTAAAGAGAGAAATCAGCCCTT 2280
QY 2292 CAGGCACTGGAGATGACCGGAAAGTGTAGAGGAGGCCAATGTTGTTTCCCGCTGT 2351
DB 2281 CAGGCACTGGAGATGACCGGAAAGTGTAGAGGAGGCCAATGTTGTTTCCCGCTGT 2340
QY 2352 GTGGATAACAGCAAAACCCGATTTTAAAGTGTTCAGGTACAGCACTTCCCTAGAGAAA 2411
DB 2341 GTGGATAACAGCAAAACCCGATTTTAAAGTGTTCAGGTACAGCACTTCCCTAGAGAAA 2400
QY 2412 CACAAGCTTTCATCTCAGGCGCTGCTTCTCTCTACTTAAAGAGGAATCAGAGAAATC 2471
DB 2401 CACAAGCTTTCATCTCAGGCGCTGCTTCTCTCTACTTAAAGAGGAATCAGAGAAATC 2460
QY 2472 TGTAAAGCTTCATGCGACCGTGAAGGACCTCAGGCTGGTCAACCAACCGGCTGCCAACA 2531
DB 2461 TGTAAAGCTTCATGCGACCGTGAAGGACCTCAGGCTGGTCAACCAACCGGCTGCCAACA 2520
QY 2532 AAGGGCTCGGCTTACGTGAGTATGAAATGAATCCAGGCGTCCGAGGCTGTGATGAAG 2591
DB 2521 AAGGGCTCGGCTTACGTGAGTATGAAATGAATCCAGGCGTCCGAGGCTGTGATGAAG 2580
QY 2592 ATGACGCGCATGACTATCAAGAGAAACATCATCAAAAGTGGCAATCAGCAACCTCCTCAG 2651
DB 2581 ATGACGCGCATGACTATCAAGAGAAACATCATCAAAAGTGGCAATCAGCAACCTCCTCAG 2640
QY 2652 AGAAAAGTTCAGAGAGAGCCAGAGACCGAGGACCGCAGGCTGGCCCTCTTTGCGG 2711
DB 2641 AGAAAAGTTCAGAGAGAGCCAGAGACCGAGGACCGCAGGCTGGCCCTCTTTGCGG 2700
QY 2712 CACACATAGGAGGAGGAGGAGGAGGAGGAGGAGGAGGAGGAGGAGGAGGAGGAGG 2771
DB 2701 CACACATAGGAGGAGGAGGAGGAGGAGGAGGAGGAGGAGGAGGAGGAGGAGGAGG 2760
QY 2772 CAGCGCCCAAGTCTCGAGCTCTCAGGCTGAGAACGCGGCTCGCGGCTCTGTCAGTT 2831
DB 2761 CAGCGCCCAAGTCTCGAGCTCTCAGGCTGAGAACGCGGCTCGCGGCTCTGTCAGTT 2820
QY 2832 GCGCGCCAGCAGCAGCAGCAGCAGCAGCAGCAGCAGCAGCAGCAGCAGCAGCAGCAG 2891
DB 2821 GCGCGCCAGCAGCAGCAGCAGCAGCAGCAGCAGCAGCAGCAGCAGCAGCAGCAGCAG 2880
QY 2892 CTGAGAAAGTGAAGGAGGAGGAGGAGGAGGAGGAGGAGGAGGAGGAGGAGGAGGAGG 2951
DB 2881 CTGAGAAAGTGAAGGAGGAGGAGGAGGAGGAGGAGGAGGAGGAGGAGGAGGAGGAGG 2940
QY 2952 GACCTCCCAACCCAGCAGTGCAGCTGGGATGGACAGGCTGGTGTCTGCTGCTGCTGCT 3011
DB 2941 GACCTCCCAACCCAGCAGTGCAGCTGGGATGGACAGGCTGGTGTCTGCTGCTGCTGCT 3000
QY 3012 AACACAGATGGCTCTCGGCTTTAGACAGAAAGGAGGAGGAGGAGGAGGAGGAGGAGG 3071
DB 3001 AACACAGATGGCTCTCGGCTTTAGACAGAAAGGAGGAGGAGGAGGAGGAGGAGGAGG 3060
QY 3072 TTCAGTCTCCCTCATATTGAGGCGAGTGCAGAGAAAGTACCACCTCTGAGGCTGGGCT 3131
DB 3061 TTCAGTCTCCCTCATATTGAGGCGAGTGCAGAGAAAGTACCACCTCTGAGGCTGGGCT 3120
QY 3132 CAGGATGTGTCTCAGATAGTTTGTATCTTAAAGACTGAGGACAGAGGAGGAGGAGGAGG 3191
DB 3121 CAGGATGTGTCTCAGATAGTTTGTATCTTAAAGACTGAGGACAGAGGAGGAGGAGG 3180
QY 3192 AGAACACATGTTTTTGGAGACAGAGTTGTCCAAATGTTTGGGAGCTGCGGCGCTTTT 3251
DB 3181 AGAACACATGTTTTTGGAGACAGAGTTGTCCAAATGTTTGGGAGCTGCGGCGCTTTT 3240
QY 3252 TTGTATGACACTTCTCTCCACCTGACAGCAGCATGTGCCCTGATCTCTTAAATTTA 3311

un 23 10:27:46 2003

us-09-763-

1241 TTGTATGACACTTCTCTCCACCCCTGCACAGACATGTGCCCGTCATTCTTTTAATTTTA 3300
1312 AAAGATGAAATGGCAGATCTAGTAATTCACAGAAATGGCTCTTGTGGGGTGGGTCTGA 3371
1301 AAAGATGAAATGGCAGATCTAGTAATTCACAGAAATGGCTCTTGTGGGGTGGGTCTGA 3360
1372 GGGAAATCAGCTATAAAACATTTGCTGGAGTTTGTTCAAATGGGGCTGTGCATTTTATA 3431
1361 GGGAAATCAGCTATAAAACATTTGCTGGAGTTTGTTCAAATGGGGCTGTGCATTTATA 3420
1432 TTATGTTTGTAAATGACATGTGACCTTCTTTTCATGTTTCTTAAAGCAGAAATATT 3491
1421 TTATGTTTGTAAATGACATGTGACCTTCTTTTCATGTTTCTTAAAGCAGAAATATT 3480
1492 GCAACATTTGTTTGTATAGGAATTTTGTGCCACCTGCTGTGGACTGTTTCTTTGCC 3551
1481 GCAACATTTGTTTGTATAGGAATTTTGTGCCACCTGCTGTGGACTGTTTCTTTGCC 3540
1552 TAGTGACTAGTGACCTGTGTTCTCTAAACATGAGTTTCAGCCCTTTGGTTTGTAAATA 3611
1541 TAGTGACTAGTGACCTGTGTTCTCTAAACATGAGTTTCAGCCCTTTGGTTTGTAAATA 3600
1612 CCATGTCAAATGCAAACTTCAATCTCCCATTTAGCTTTTAACTGACGTTCTCTTC 3671
1601 CATGTCAAATGCAAACTTCAATCTCCCATTTAGCTTTTAACTGACGTTCTCTTC 3660